Excerpts from 180 NAC 4 for Veterinary Facilities

TITLE 180 CONTROL OF RADIATION

CHAPTER 4 STANDARDS FOR PROTECTION AGAINST RADIATION

Excerpts from 180 NAC 4 for Veterinary Facilities

FORMS

Form NRH-1 Cumulative Occupation Exposure History
Form NRH 2 Occupational Exposure Record for a Monitoring Period

● Copies of the Code of Federal Regulations (CFR) cited in this Chapter are available for inspection at the Department of Health and Human Services Regulation and Licensure, 301 Centennial Mall South, 3rd Floor, Lincoln, Nebraska.

40 CFR 190 through 259 (July 1, 2002)
49 CFR 100 through 185 (October 1, 2001)

Or at http://www.access.gpo.gov/nara/cfr/index.html

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Excerpts from 180 NAC 4 for Veterinary Facilities

TITLE 180 CONTROL OF RADIATION

CHAPTER 4 STANDARDS FOR PROTECTION AGAINST RADIATION

4-001 SCOPE AND AUTHORITY

4-001.01 180 NAC 4 establishes standards for protection against ionizing radiation resulting from activities conducted pursuant to licenses or registrations issued by the Agency. The regulations are authorized by and implement the Nebraska Radiation Control Act, Neb. Stat. Rev. §§ 71-3501 to 3519.

4-001.02 The requirements of 180 NAC 4 are designed to control the receipt, possession, use, transfer, and disposal of sources of radiation by any licensee or registrant so the total dose to an individual, including doses resulting from all sources of radiation other than background radiation, does not exceed the standards for protection against radiation prescribed in 180 NAC 4. However, nothing in 180 NAC 4 shall be construed as limiting actions that may be necessary to protect health and safety.

4-001.03 Except as specifically provided in other Chapters of Title 180, 180 NAC 4 applies to persons licensed or registered by the Agency to receive, possess, use, transfer, or dispose of sources of radiation. The limits in 180 NAC 4 do not apply to doses due to background radiation, to exposure of patients to radiation for the purpose of medical diagnosis or therapy, to exposure from individuals administered radioactive material and released in accordance with 180 NAC 7-030 or to voluntary participation in medical research programs.

4-001.04 40 CFR as published on July 1, 2002 and 49 CFR as published October 1, 2001 and referred throughout this Chapter are herein incorporated by reference and available for viewing at the Nebraska Department of Health and Human Services Regulation and Licensure, Public Health Assurance Division, 301 Centennial Mall South, 3rd Floor, Lincoln, Nebraska 68509.

4-002 DEFINITIONS

Dosimetry processor means an individual or an organization that processes and evaluates individual monitoring devices in order to determine the radiation dose delivered to the monitoring devices.

Nonstochastic effect means a health effect, the severity of which varies with the dose and for which a threshold is believed to exist. Radiation-induced cataract formation is an example of a nonstochastic effect. For purposes of these regulations, a "deterministic effect" is an equivalent term.

Quarter means a period of time equal to one-fourth of the year observed by the licensee or registrant, approximately 13 consecutive weeks, providing that the beginning of the first quarter in a year coincides with the starting date of the year and that no day is omitted or duplicated in consecutive quarters.

Stochastic effect means a health effect that occurs randomly and for which the probability of the effect occurring, rather than its severity, is assumed to be a linear function of dose without threshold. Hereditary effects and cancer incidence are examples of stochastic effects.

Weighting factor w_T for an organ or tissue (T) means the proportion of the risk of stochastic effects resulting from irradiation of that organ or tissue to the total risk of stochastic effects when the whole body is irradiated uniformly. For calculating the effective dose equivalent, the values of w_T are:

ORGAN DOSE WEIGHTING FACTORS	
Organ or Tissue	w_T
Gonads	0.25
Breast	0.15
Red Bone Marrow	0.12
Lung	0.12
Thyroid	0.03
Bone Surfaces	0.03
Remainder	0.30[a]
Whole Body	1.00[b]

[a] 0.30 results from 0.06 for each of 5 "remainder" organs, excluding the skin and the lens of the eye, that receive the highest doses.

[b] For the purpose of weighting the external whole body dose, for adding it to the internal dose, a single weighting factor, $w_T = 1.0$, has been specified. The use of other weighting factors for external exposure will be approved on a case-by-case basis until such time as specific guidance is issued.

RADIATION PROTECTION PROGRAMS

4-004 RADIATION PROTECTION PROGRAMS

4-004.01 Each licensee or registrant must develop, document, and implement a radiation protection program sufficient to ensure compliance with the provisions of 180 NAC 4. See 180 NAC 4-045 for recordkeeping requirements relating to these programs.

4-004.02 The licensee or registrant must use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and public doses that are as low as is reasonably achievable (ALARA).

4-004.03 The licensee or registrant must, at intervals not to exceed 12 months, review the radiation protection program content and implementation.

4-004.04 To implement the ALARA requirements of 180 NAC 4-004.02 and notwithstanding the requirements in 180 NAC 4-013, a constraint on air emissions of radioactive material to the environment, excluding Radon-222 and its daughters must be established by licensees, such that the individual member of the public likely to receive the highest dose will not be expected to receive a total effective dose equivalent in excess of 10 mrem (0.1 mSv) per year from these emissions. If a licensee subject to this requirement exceeds this dose constraint, the licensee must report the exceedance as provided in 180 NAC 4-059and promptly take appropriate corrective action to ensure against a recurrence.

OCCUPATIONAL DOSE LIMITS

4-005 OCCUPATIONAL DOSE LIMITS FOR ADULTS

4-005.01 The licensee or registrant must control the occupational dose to individual adults, except for planned special exposures pursuant to 180 NAC 4-010, to the following dose limits:

1. An annual limit, which is the more limiting of:

    a. The total effective dose equivalent being equal to 0.05 Sv (5 rem); or
    b. The sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 0.5 Sv (50 rem).

2. The annual limits to the lens of the eye, to the skin, and to the extremities which are:

    a. An lens dose equivalent of 0.15 Sv (15 rem), and
    b. A shallow dose equivalent of 0.5 Sv (50 rem) to the skin or to any extremity.

4-005.02 Doses received in excess of the annual limits, including doses received during accidents, emergencies, and planned special exposures, must be subtracted from the limits for planned special exposures that the individual may receive during the current year and during the individual's lifetime. See 4-010.05, item 1 and 2.

4-005.03 The assigned deep dose equivalent and shallow dose equivalent must be for the portion of the body receiving the highest exposure.

4-005.04 The deep dose equivalent, lens-dose equivalent and shallow dose equivalent may be assessed from surveys or other radiation measurements for the purpose of demonstrating compliance with the occupational dose limits, if the individual monitoring device was not in the region of highest potential exposure, or the results of individual monitoring are unavailable.

4-005.07 The licensee or registrant must reduce the dose that an individual may be allowed to receive in the current year by the amount of occupational dose received while employed by any other person. See180 NAC 4-009.05.

4-009 DETERMINATION OF PRIOR OCCUPATIONAL DOSE

4-009.01 For each individual who may enter the licensee's or registrant's restricted area and is likely to receive, in a year, an occupational dose requiring monitoring pursuant to 180 NAC 4-022, the licensee or registrant must:

1. Determine the occupational radiation dose received during the current year; and
2. Attempt to obtain the records of cumulative occupational radiation dose.

4-009.03 In complying with the requirements of 180 NAC 4-009.01, a licensee or registrant may:

1. Accept, as a record of the occupational dose that the individual received during the current year, a written signed statement from the individual, or from the individual's most recent employer for work involving radiation exposure, that discloses the nature and the amount of any occupational dose that the individual received during the current year; and
2. Accept, as the record of cumulative radiation dose, an up-to-date Agency Form NRH-1, or equivalent, signed by the individual and countersigned by an appropriate official of the most recent employer for work involving radiation exposure, or the individual's current employer, if the individual is not employed by the licensee or registrant; and
3. Obtain reports of the individual's dose equivalent from the most recent employer for work involving radiation exposure, or the individual's current employer, if the individual is not employed by the licensee or registrant, by telephone, telegram, electronic media, or letter. The licensee or registrant must request a written verification of the dose data if the authenticity of the transmitted report cannot be established.

4-009.04 The licensee or registrant must record the exposure history, as required by 180 NAC 4-009.01, on Agency Form NRH-1, or other clear and legible record, including all of the information required on that form.

1. The form or record must show each period in which the individual received occupational exposure to radiation or radioactive material and must be signed by the individual who received the exposure. For each period for which the licensee or registrant obtains reports, the licensee or registrant must use the dose shown

in the report in preparing Agency Form NRH-1 or equivalent. For any period in which the licensee or registrant does not obtain a report, the licensee or registrant must place a notation on Agency Form NRH-1 indicating the periods of time for which data are not available.

2. Licensees or registrants are not required to partition historical dose between external dose equivalent(s) and internal committed dose equivalent(s). Further, occupational exposure histories obtained and recorded on Agency Form NRH-1 before the effective date of these regulations, might not have included effective dose equivalent, but may be used in the absence of specific information on the intake of radionuclides by the individual.

4-009.05 If the licensee or registrant is unable to obtain a complete record of an individual's current and previously accumulated occupational dose, the licensee or registrant must assume:

1. In establishing administrative controls under 180 NAC 4-005.07for the current year, that the allowable dose limit for the individual is reduced by 12.5 mSv (1.25 rem) for each quarter for which records were unavailable and the individual was engaged in activities that could have resulted in occupational radiation exposure; and
2. That the individual is not available for planned special exposures.

4-009.06 The licensee or registrant must retain the records on Agency Form NRH-1 or equivalent until the Agency terminates each pertinent license or registration requiring this record. The licensee or registrant must retain records used in preparing Agency Form NRH-1 or equivalent for 3 years after the record is made. This includes records required under the standards for protection against radiation in effect prior to May 30, 1994.

4-011 OCCUPATIONAL DOSE LIMITS FOR MINORS: The annual occupational dose limits for minors are 10% of the annual occupational dose limits specified for adult workers in 180 NAC 4-005.

4-012 DOSE EQUIVALENT TO AN EMBRYO/FETUS

4-012.01 The licensee or registrant must ensure that the dose equivalent to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, does not exceed 5 mSv (0.5 rem). See 180 NAC 4-052 for record keeping requirements.

4-012.02 The licensee or registrant must make efforts to avoid substantial variation above a uniform monthly exposure rate to a declared pregnant woman so as to satisfy the limit in 180 NAC 4-012.01.[1]

4-012,03 The dose to an embryo/fetus must be taken as the sum of:

[1]The National Council on Radiation Protection and Measurements recommended in NCRP Report No. 91 "Recommendations on Limits for Exposure to Ionizing Radiation" (June 1, 1987) that no more than 0.5 mSv (0.05 rem) to the embryo\fetus be received in any one month.

1. The deep dose equivalent to the declared pregnant woman; and
2. The equivalent dose to the embryo/fetus from radionuclides in the embryo/fetus and radionuclides in the declared pregnant woman.

4-012.04 If by the time the woman declares pregnancy to the licensee or registrant, the dose equivalent to the embryo/fetus has exceeded 4.5 mSv (0.45 rem), the licensee or registrant must be deemed to be in compliance with 180 NAC 4-012.01if the additional dose to the embryo/fetus does not exceed 0.50 mSv (0.05 rem) during the remainder of the pregnancy.

RADIATION DOSE LIMITS FOR INDIVIDUAL MEMBERS OF THE PUBLIC

4-013 DOSE LIMITS FOR INDIVIDUAL MEMBERS OF THE PUBLIC

4-013.01 Each licensee or registrant must conduct operations so that:

1. The total effective dose equivalent to individual members of the public from the licensed or registered operation does not exceed 1 mSv (0.1 rem) in a year, exclusive of the dose contributions from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released in accordance with 180 NAC 7-030, from voluntary participation in medical research programs, and from the licensee's or registrant's disposal of radioactive material into sanitary sewerage in accordance with 180 NAC 4-041, and
2. The dose in any unrestricted area from external sources, exclusive of the dose contributions from patients administered radioactive material and released in accordance with 180 NAC 7-030, does not exceed 0.02 mSv (0.002 rem) in any one hour.

4-013.02 If the licensee or registrant permits members of the public to have access to restricted areas, the limits for members of the public continue to apply to those individuals.

4-013.03 A licensee, registrant, or an applicant for a license or registration may apply for prior Agency authorization to operate up to an annual dose limit for an individual member of the public of 5 mSv (0.5 rem). This application must include the following information:

1. Demonstration of the need for and the expected duration of operations in excess of the limit in 180 NAC 4-013.01; and
2. The licensee's or registrant's program to assess and control dose within the 5 mSv (0.5 rem) annual limit; and
3. The procedures to be followed to maintain the dose ALARA.

4-013.05 The Agency may impose additional restrictions on radiation levels in unrestricted areas and on the total quantity of radionuclides that a licensee or registrant may release in effluents in order to restrict the collective dose.

4-014 COMPLIANCE WITH DOSE LIMITS FOR INDIVIDUAL MEMBERS OF THE PUBLIC:

4-014.01 The licensee or registrant must make or cause to be made surveys of radiation levels in unrestricted areas and radioactive materials in effluents released to unrestricted

areas to demonstrate compliance with the dose limits for individual members of the public in 180 NAC 4-013.

4-014.02 A licensee or registrant must show compliance with the annual dose limit in 180 NAC 4-013 by:

1. Demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed or registered operation does not exceed the annual dose limit; or
2. Demonstrating that:

    a. The annual average concentrations of radioactive material released in gaseous and liquid effluents at the boundary of the unrestricted area do not exceed the values specified in Table II of Appendix 180 NAC 4-B; and
    b. If an individual were continuously present in an unrestricted area, the dose from external sources would not exceed 0.02 mSv (0.002 rem) in an hour and 0.5 mSv (0.05 rem) in a year.

SURVEYS AND MONITORING

4-021 GENERAL

4-021.01 Each licensee or registrant must make, or cause to be made, surveys that:

1. Are necessary for the licensee or registrant to comply with 180 NAC 4; and
2. Are necessary under the circumstances to evaluate:

    a. The magnitude and extent of radiation levels; and
    b. Concentrations or quantities of radioactive material; and
    c. The potential radiological hazards that could be present.

4-021.02 The licensee or registrant must ensure that instruments and equipment used for quantitative radiation measurements (e.g., dose rate and effluent monitoring) are calibrated at intervals not to exceed 12 months for the radiation measured, except when a more frequent interval is specified in another applicable chapter or a license condition.

4-021.03 All personnel dosimeters (except for direct and indirect reading pocket ionization chambers and those dosimeters used to measure the dose to any extremity) that require processing to determine the radiation dose and that are used by licensees and registrants to comply with180 NAC 4-005, with other applicable provisions of these regulations, or with conditions specified in a license or registration must be processed and evaluated by a dosimetry processor:

1. Holding current personnel dosimetry accreditation from the National Voluntary Laboratory Accreditation Program (NVLAP) of the National Institute of Standards and Technology; and
2. Approved in this accreditation process for the type of radiation or radiations included in the NVLAP program that most closely approximates the type of radiation or radiations for which the individual wearing the dosimeter is monitored.

4-021.04 The licensee or registrant must ensure that adequate precautions are taken to prevent a deceptive exposure of an individual monitoring device.

4-022 CONDITIONS REQUIRING INDIVIDUAL MONITORING OF EXTERNAL AND INTERNAL OCCUPATIONAL DOSE: Each licensee or registrant must monitor exposures to radiation and radioactive material at levels sufficient to demonstrate compliance with the occupational dose limits of 180 NAC 4. As a minimum:

4-022.01 Each licensee or registrant must monitor occupational exposures to radiation from registered, licensed and unlicensed radiation sources under the control of the licensee or registrant and must supply and require the use of individual monitoring devices by:

1. Adults likely to receive, in 1 year from sources external to the body, a dose in excess of 10% of the limits in 180 NAC 4-005.01; and
2. Minors likely to receive, in 1 year, from sources external to the body, a deep dose equivalent in excess of 0.1 rem (1 mSv), a lens dose equivalent in excess of 0.15 rem (1.5 mSv), or a shallow dose equivalent to the skin or to the extremities in excess of 0.5 rem (5 mSv);
3. Declared pregnant women likely to receive during the entire pregnancy, from radiation sources external to the body, a deep dose equivalent in excess of 0.1 rem (1 mSv);[2] and
4. Individuals entering a high or very high radiation area.

STORAGE AND CONTROL OF LICENSED OR REGISTERED SOURCES OF RADIATION

4-031 SECURITY OF STORED SOURCES OF RADIATION: The licensee or registrant must secure licensed or registered sources of radiation that are stored in unrestricted areas from unauthorized removal or access.

4-032 CONTROL OF SOURCES OF RADIATION NOT IN STORAGE

4-032.02 The registrant must maintain control of registered radiation machines that are in an unrestricted area and that are not in storage.

PRECAUTIONARY PROCEDURES

4-036 LABELING CONTAINERS AND RADIATION MACHINES

4-036.03 Each registrant must ensure that each radiation machine is labeled in a conspicuous manner which cautions individuals that radiation is produced when it is energized.

RECORDS

4-046 GENERAL PROVISONS

[2] All of the occupational doses in 180 NAC 4-005 continue to be applicable to the declared pregnant worker as long as the embryo/fetus dose limit is not exceeded.

4-046.01 Each licensee or registrant must use the SI units becquerel, gray, sievert and coulomb per kilogram, or the special units curie, rad, rem, and roentgen, including multiples and subdivisions, and must clearly indicate the units of all quantities on records required by 180 NAC 4.

4-046.03 The licensee or registrant must make a clear distinction among the quantities entered on the records required by 180 NAC 4, such as, total effective dose equivalent, total organ dose equivalent, shallow dose equivalent, lens dose equivalent, deep dose equivalent, or committed effective dose equivalent.

4-047 RECORDS OF RADIATION PROTECTION PROGRAMS

4-047.01 Each licensee or registrant must maintain records of the radiation protection program, including:

1. The provisions of the program; and
2. Audits and other reviews of program content and implementation.

4-047.02 The licensee or registrant must retain the records required by 180 NAC 4-047.01, item 1 until the Agency terminates each pertinent license or registration requiring the record. The licensee or registrant must retain the records required by 180 NAC 4-047.01, item 2 for 3 years after the record is made.

4-048 RECORDS OF SURVEYS

4-048.01 Each licensee or registrant must maintain records showing the results of surveys and calibrations required by 180 NAC 4-021 and 4-038.02. The licensee or registrant must retain these records for 3 years after the record is made.

4-048.02 The licensee or registrant must retain each of the following records until the Agency terminates each pertinent license or registration requiring the record:

1. Records of the results of surveys to determine the dose from external sources of radiation used, in the absence of or in combination with individual monitoring data, in the assessment of individual dose equivalents. This includes those records of results of surveys to determine the dose from external sources and used, in the absence of or in combination with individual monitoring data, in the assessment of individual dose equivalents required under the standards for protection against radiation in effect prior to May 30, 1994; and

4-050 RECORDS OF PRIOR OCCUPATIONAL DOSE: For each individual who is likely to receive in a year, an occupational dose requiring monitoring pursuant to 180 NAC 4-022 the licensee or registrant must: Retain the records of prior occupational dose and exposure history as specified in 180 NAC 4-009 on Agency Form NRH-1 or equivalent until the Agency terminates each pertinent license or registration requiring this record. The licensee or registrant must retain records used in preparing Agency Form NRH-1 for 3 years after the record is made.

4-052 RECORDS OF INDIVIDUAL MONITORING RESULTS

4-052.01 Recordkeeping Requirement. Each licensee or registrant must maintain records of doses received by all individuals for whom monitoring was required pursuant to 180 NAC 4-022 and records of doses received during planned special exposures, accidents, and emergency conditions. Assessments of dose equivalent and records made using units in effect before October 30, 1996 for 180 NAC 4 need not be changed. These records must include, when applicable:

1. The deep dose equivalent to the whole body, eye dose equivalent, shallow dose equivalent to the skin, and shallow dose equivalent to the extremities; and
2. The estimated intake of radionuclides, see 180 NAC 4-006; and
3. The committed effective dose equivalent assigned to the intake of radionuclides; and
4. The specific information used to calculate the committed effective dose equivalent pursuant to 180 NAC 4-008.03; and
5. The total effective dose equivalent when required by 180 NAC 4-006; and
6. The total of the deep dose equivalent and the committed dose to the organ receiving the highest total dose.

4-052.02 Recordkeeping Frequency. The licensee or registrant must make entries of the records specified in 180 NAC 4-055.01 at intervals not to exceed 1 year.

4-052.03 Recordkeeping Format. The licensee or registrant must maintain the records specified in 180 NAC 4-052.01 on Agency Form NRH-2, in accordance with the instructions for Agency Form NRH-2, or in clear and legible records containing all the information required by Agency Form NRH-2.

4-052.04 The licensee or registrant must maintain the records of dose to an embryo/fetus with the records of dose to the declared pregnant woman. The declaration of pregnancy, including the estimated date of conception, must also be kept on file, but may be maintained separately from the dose records.

4-052.05 The licensee or registrant must retain each required form or record until the Agency terminates each pertinent license or registration requiring the record.

4-053 RECORDS OF DOSE TO INDIVIDUAL MEMBERS OF THE PUBLIC

4-053.01 Each licensee or registrant must maintain records sufficient to demonstrate compliance with the dose limit for individual members of the public. See 180 NAC 4-013.

4-053.02 The licensee or registrant must retain the records required by 180 NAC 4-053 until the Agency terminates each pertinent license or registration requiring the record.

4-056 FORM OF RECORDS: Each record required by 180 NAC 4 must be legible throughout the specified retention period. The record must be the original or a reproduced copy or a microform, provided that the copy or microform is authenticated by authorized personnel and that the microform is capable of producing a clear copy throughout the required retention period. The record may also be stored in electronic media with the capability for producing legible, accurate, and complete records during the required retention period. Records, such as letters, drawings, and specifications, must include all pertinent information, such as stamps, initials, and signatures. The

licensee or registrant must maintain adequate safeguards against tampering with and loss of records.

REPORTS

4-057 REPORTS OF STOLEN, LOST, OR MISSING LICENSED OR REGISTERED SOURCES OF RADIATION

4-057.01 Telephone Reports. Each licensee or registrant must report to the Agency by telephone as follows:

1. Immediately after its occurrence becomes known to the licensee or registrant, stolen, lost, or missing licensed radioactive material in an aggregate quantity equal to or greater than 1,000 times the quantity specified in Appendix 180 NAC 4-C under such circumstances that it appears to the licensee that an exposure could result to individuals in unrestricted areas; or
2. Within 30 days after its occurrence becomes known to the licensee or registrant, lost, stolen, or missing licensed radioactive material in an aggregate quantity greater than 10 times the quantity specified in Appendix 180 NAC 4-C that is still missing.
3. Immediately after its occurrence becomes known to the registrant, a stolen, lost, or missing radiation machine.

4-057.02 Written Reports. Each licensee or registrant required to make a report pursuant to 180 NAC 4-057.01 must, within 30 days after making the telephone report, make a written report to the Agency setting forth the following information:

1. A description of the licensed or registered source of radiation involved, including, for radioactive material, the kind, quantity, and chemical and physical form; and, for radiation machines, the manufacturer, model and serial number, type and maximum energy of radiation emitted;
2. A description of the circumstances under which the loss or theft occurred; and
3. A statement of disposition, or probable disposition, of the licensed or registered source of radiation involved; and
4. Exposures of individuals to radiation, circumstances under which the exposures occurred, and the possible total effective dose equivalent to persons in unrestricted areas; and
5. Actions that have been taken, or will be taken, to recover the source of radiation; and
6. Procedures or measures that have been, or will be, adopted to ensure against a recurrence of the loss or theft of licensed or registered sources of radiation.

4-057.03 Subsequent to filing the written report, the licensee or registrant must also report additional substantive information on the loss or theft within 30 days after the licensee or registrant learns of such information.

4-057.04 The licensee or registrant must prepare any report filed with the Agency pursuant to 180 NAC 4-057 so that names of individuals who may have received exposure to radiation are stated in a separate and detachable portion of the report.

4-058 NOTIFICATION OF INCIDENTS

4-058.01 Immediate Notification: Notwithstanding other requirements for notification, each licensee or registrant must immediately report each event involving a source of radiation possessed by the licensee or registrant that may have caused or threatens to cause any of the following conditions:

1. An individual to receive:

    a. A total effective dose equivalent of 0.25 Sv (25 rem) or more; or
    b. a lens dose equivalent of 0.75 Sv (75 rem) or more; or
    c. a shallow dose equivalent to the skin or extremities of 2.5 Gy (250 rad) or more; or

4-058.02 Twenty-Four Hour Notification: Each licensee or registrant must, within 24 hours of discovery of the event, report to the Agency each event involving loss of control of a licensed or registered source of radiation possessed by the licensee or registrant that may have caused, or threatens to cause, any of the following conditions:

1. An individual to receive, in a period of 24 hours:

    a. A total effective dose equivalent exceeding 0.05 Sv (5 rem); or
    b. A lens dose equivalent exceeding 0.15 Sv (15 rem); or
    c. A shallow dose equivalent to the skin or extremities exceeding 0.5 Sv (50 rem); or

4-058.03 The licensee or registrant must prepare each report filed with the Agency pursuant to 180 NAC 4-058 so that names of individuals who have received exposure to sources of radiation are stated in a separate and detachable portion of the report.

4-058.04 Licensees or registrants must make the reports required by 180 NAC 4-058.01 and 4-058.02 by initial contact by telephone to the Agency and must confirm the initial contact by telegram, mailgram, or electronic media to the Agency.

4-059 REPORTS OF EXPOSURES, RADIATION LEVELS, AND CONCENTRATIONS OF RADIOACTIVE MATERIAL EXCEEDING THE CONSTRAINTS OR LIMITS

4-059.01 Reportable Events: In addition to the notification required by 180 NAC 4-058, each licensee or registrant must submit a written report within 30 days after learning of any of the following occurrences:

1. Any incident for which notification is required by 180 NAC 4-058; or
2. Doses in excess of any of the following:
    a. The occupational dose limits for adults in 180 NAC 4-005; or
    b. The occupational dose limits for a minor in 180 NAC 4-011; or
    c. The limits for an embryo/fetus of a declared pregnant woman in 180 NAC 4-012; or
    d. The limits for an individual member of the public in 180 NAC 4-013; or
    e. Any applicable limit in the license; or

f. The ALARA constraints for air emissions established under 180 NAC 4-004.04; or

3. Levels of radiation or concentrations of radioactive material in:

a. A restricted area in excess of applicable limits in the license; or
b. An unrestricted area in excess of 10 times the applicable limit set forth in 180 NAC 4 or in the license, whether or not involving exposure of any individual in excess of the limits in 180 NAC 4-013; or

4-059.02 Contents of Reports

1. Each report required by 180 NAC 4-059 must describe the extent of exposure of individuals to radiation and radioactive material, including, as appropriate:

a. Estimates of each individual's dose; and
b. The levels of radiation and concentrations of radioactive material involved; and
c. The cause of the elevated exposures, dose rates, or concentrations; and
d. Corrective steps taken or planned to ensure against a recurrence, including the schedule for achieving conformance with applicable limits, ALARA constraints , generally applicable environmental standards and associated license conditions.

2. Each report filed pursuant to 180 NAC 4-059.01 must include for each individual exposed: the name, Social Security account number, and date of birth. With respect to the limit for the embryo fetus in 180 NAC 4-012, the identifiers should be those of the declared pregnant woman. The report must be prepared so that this information is stated in a separate and detachable portion of the report.

4-059.03 All licensees or registrants who make reports pursuant to 180 NAC 4-059.01 must submit the report in writing to the Agency.

4-063 NOTIFICATIONS AND REPORTS TO INDIVIDUALS

4-063.01 Requirements for notification and reports to individuals of exposure to radiation or radioactive material are specified in 180 NAC 10-004.

4-063.02 When a licensee or registrant is required, pursuant to the provisions of 180 NAC 4-059, 4-060, and 4-062, to report to the Agency any exposure of identified occupationally exposed individual, or an identified member of the public, to radiation or radioactive material, the licensee must also provide a copy of the report submitted to the Agency to the individual. This report must be transmitted at a time no later than the transmittal to the Agency.

Nebraska Department of Health and Human Services Regulation and Licensure

CUMULATIVE OCCUPATIONAL EXPOSURE HISTORY

NRH-1
Effective Date July 22, 2001

1. NAME (LAST, FIRST, MIDDLE INITIAL)	2. IDENTIFICATION NUMBER	3. ID TYPE	4. SEX MALE ☐ FEMALE ☐	5. DATE OF BIRTH

6. MONITORING PERIOD		7. LICENSEE OR REGISTRANT NAME		8. LICENSE OR REGISTRATION NUMBER		9. RECORD ☐ ESTIMATE ☐ NO RECORD ☐	10. ROUTINE ☐ PSE ☐
11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE	18. TODE
6. MONITORING PERIOD		7. LICENSEE OR REGISTRANT NAME		8. LICENSE OR REGISTRATION NUMBER		9. RECORD ☐ ESTIMATE ☐ NO RECORD ☐	10. ROUTINE ☐ PSE ☐
11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE	18. TODE
6. MONITORING PERIOD		7. LICENSEE OR REGISTRANT NAME		8. LICENSE OR REGISTRATION NUMBER		9. RECORD ☐ ESTIMATE ☐ NO RECORD ☐	10. ROUTINE ☐ PSE ☐
11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE	18. TODE
6. MONITORING PERIOD		7. LICENSEE OR REGISTRANT NAME		8. LICENSE OR REGISTRATION NUMBER		9. RECORD ☐ ESTIMATE ☐ NO RECORD ☐	10. ROUTINE ☐ PSE ☐
11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE	18. TODE
6. MONITORING PERIOD		7. LICENSEE OR REGISTRANT NAME		8. LICENSE OR REGISTRATION NUMBER		9. RECORD ☐ ESTIMATE ☐ NO RECORD ☐	10. ROUTINE ☐ PSE ☐
11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE	18. TODE
6. MONITORING PERIOD		7. LICENSEE OR REGISTRANT NAME		8. LICENSE OR REGISTRATION NUMBER		9. RECORD ☐ ESTIMATE ☐ NO RECORD ☐	10. ROUTINE ☐ PSE ☐
11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE	18. TODE

19. SIGNATURE OF MONITORED INDIVIDUAL	20. DATE SIGNED	21. CERTIFYING ORGANIZATION	22. SIGNATURE OF DESIGNEE	23. DATE SIGNED

INSTRUCTIONS AND ADDITIONAL INFORMATION PERTINENT TO THE COMPLETION OF NRH-1

(All doses should be stated in rems)

1. Type or print the full name of the monitored individual in the order of last name (include "Jr," "Sr," "III," etc.), first name, middle initial (if applicable).

2. Enter the individual's identification number, including punctuation. This number should be the 9-digit social security number if at all possible. If the individual has no social security number, enter the number from another official identification such as a passport or work permit.

3. Enter the code for the type of identification used as shown below:

CODE	ID TYPE
SSN	U.S. Social Security Number
PPN	Passport Number
CSI	Canadian Social Insurance Number
WPN	Work Permit Number
IND	INDEX Identification Number
OTH	Other

4. Check the box that denotes the sex of the individual being monitored.

5. Enter the date of birth of the individual being monitored in the format MM/DD/YY.

6. Enter the monitoring period for which this report is filed. The format should be MM/DD/YY - MM/DD/YY.

7. Enter the name of the licensee, registrant, or facility not licensed by the Agency that provided monitoring.

8. Enter the Agency license or registration number or numbers.

9. Place an "X" in Record, Estimate, or No Record. Choose "Record" if the dose data listed represent a final determination of the dose received to the best of the licensee's or registrant's knowledge. Choose "Estimate" only if the listed dose data are preliminary and will be superseded by a final determination resulting in a subsequent report. An example of such an instance would be dose data based on self-reading dosimeter results and the licensee or registrant intends to assign the record dose on the basis of TLD results that are not yet available.

10. Place an "X" in either Routine or PSE. Choose "Routine" if the data represent the results of monitoring for routine exposures. Choose "PSE" if the listed dose data represents the results of monitoring of planned specialexposures received during the monitoring period. If more than one PSE was received in a single year, the licensee should sum them and report the total of all PSEs.

11. Enter the deep dose equivalent (DDE) to the whole body.

12. Enter the eye dose equivalent (LDE) recorded for the lens of the eye.

13. Enter the shallow dose equivalent recorded for the skin of the whole body (SDE,WB).

14. Enter the shallow dose equivalent recorded for the skin of the extremity receiving the maximum dose (SDE,ME).

15. Enter the committed effective dose equivalent (CEDE).

16. Enter the committed dose equivalent (CDE) recorded for the maximally exposed organ.

17. Enter the total effective dose equivalent (TEDE). The TEDE is the sum of items 11 and 15.

18. Enter the total organ dose equivalent (TODE) for the maximally exposed organ. The TODE is the sum of items 11 and 16.

19. Signature of the monitored individual. The signature of the monitored individual on this form indicates that the information contained on the form is complete and correct to the best of his or her knowledge.

20. Enter the date this form was signed by the monitored individual.

21. [OPTIONAL] Enter the name of the licensee, registrant or facility not licensed by the Agency, providing monitoring for exposure to radiation (such as a DOE facility) or the employer if the individual is not employed by the licensee or registrant and the employer chooses to maintain exposure records for its employees.

22. [OPTIONAL] Signature of the person designated to represent the licensee, registrant or employer entered in item 21. The licensee, registrant or employer who chooses to countersign the form should have on file documentation of all the information on the Agency Form Y being signed.

23. [OPTIONAL] Enter the date this form was signed by the designated representative.

Nebraska Department of Health and Human Services Regulation and Licensure

NRH-2
Effective Date July 22, 2001

OCCUPATIONAL EXPOSURE RECORD FOR A MONITORING PERIOD

1. NAME (LAST, FIRST, MIDDLE INITIAL)	2. IDENTIFICATION NUMBER	3. ID TYPE	4. SEX MALE_____ FEMALE_____	5. DATE OF BIRTH

6. MONITORING PERIOD	7. LICENSEE OR REGISTRANT NAME	8. LICENSE OR REGISTRATION NUMBER(S)	9A.		9B.	
				RECORD		ROUTINE
				ESTIMATE		PSE

INTAKES

10A. RADIONUCLIDE	10B. CLASS	10C. MODE	10D. INTAKE IN ΦCi

DOSES (in rem)

DEEP DOSE EQUIVALENT (DDE)	11.
EYE DOSE EQUIVALENT TO THE LENS OF THE EYE (LDE)	12.
SHALLOW DOSE EQUIVALENT, WHOLE BODY (SDE,WB)	13.
SHALLOW DOSE EQUIVALENT, MAX EXTREMITY (SDE,ME)	14.
COMMITTED EFFECTIVE DOSE EQUIVALENT (CEDE)	15.
COMMITTED DOSE EQUIVALENT, MAXIMALLY EXPOSED ORGAN (CDE)	16.
TOTAL EFFECTIVE DOSE EQUIVALENT (BLOCKS 11+15) (TEDE)	17.
TOTAL ORGAN DOSE EQUIVALENT, MAX ORGAN (BLOCKS 11+16) (TODE)	18.

19. COMMENTS

20. SIGNATURE -- LICENSEE OR REGISTRANT	21. DATE PREPARED

INSTRUCTIONS AND ADDITIONAL INFORMATION PERTINENT TO THE COMPLETION OF NRH-2
(All doses should be stated in rems)

1. Type or print the full name of the monitored individual in the order of last name (include "Jr," "Sr," "III," etc.), first name, middle initial (if applicable).

2. Enter the individual's identification number, including punctuation. This number should be the 9-digit social security number if at all possible. If the individual has no social security number, enter the number from another official identification such as a passport or work permit.

3. Enter the code for the type of identification used as shown below:

CODE	ID TYPE
SSN	U.S. Social Security Number
PPN	Passport Number
CSI	Canadian Social Insurance Number
WPN	Work Permit Number
IND	INDEX Identification Number
OTH	Other

4. Check the box that denotes the sex of the individual being monitored.

5. Enter the date of birth of the individual being monitored in the format MM/DD/YY.

6. Enter the monitoring period for which this report is filed. The format should be MM/DD/YY - MM/DD/YY.

7. Enter the name of the licensee or registrant.

8. Enter the Agency license or registration number or numbers.

9A. Place an "X" in Record or Estimate. Choose "Record" if the dose data listed represent a final determination of the dose received to the best of the licensee's or registrant's knowledge. Choose "Estimate" only if the listed dose data are preliminary and will be superseded by a final determination resulting in a subsequent report. An example of such an instance would be dose data based on self-reading dosimeter results and the licensee intends to assign the record dose on the basis of TLD results that are not yet available.

9B. Place an "X" in either Routine or PSE. Choose "Routine" if the data represent the results of monitoring for routine exposures. Choose "PSE" if the listed dose data represents the results of monitoring of planned special exposures received during the monitoring period. If more than one PSE was received in a single year, the licensee or registrant should sum them and report the total of all PSEs.

10A. Enter the symbol for each radionuclide that resulted in an internal exposure recorded for the individual, using the format "Xx-###x," for instance, Cs-137 or Tc-99m.

10B. Enter the lung clearance class as listed in Appendix B to Part D (D, W, Y, V, or O for other) for all intakes by inhalation.

10C. Enter the mode of intake. For inhalation, enter "H." For absorption through the skin, enter "B." For oral ingestion, enter "G." For injection, enter "J."

10D. Enter the intake of each radionuclide in ΦCi.

11. Enter the deep dose equivalent (DDE) to the whole body.

12. Enter the eye dose equivalent (LDE) recorded for the lens of the eye.

13. Enter the shallow dose equivalent recorded for the skin of the whole body (SDE,WB).

14. Enter the shallow dose equivalent recorded for the skin of the extremity receiving the maximum dose (SDE,ME).

15. Enter the committed effective dose equivalent (CEDE) or "NR" for "Not Required" or "NC" for "Not Calculated".

16. Enter the committed dose equivalent (CDE) recorded for the maximally exposed organ or "NR" for "Not Required" or "NC" for "Not Calculated".

17. Enter the total effective dose equivalent (TEDE). The TEDE is the sum of items 11 and 15.

18. Enter the total organ dose equivalent (TODE) for the maximally exposed organ. The TODE is the sum of items 11 and 16.

19. Signature of the person designated to represent the licensee or registrant.

20. Enter the date this form was prepared.

21. COMMENTS.
In the space provided, enter additional information that might be needed to determine compliance with limits. An example might be to enter the note that the SDE,ME was the result of exposure from a discrete hot particle. Another possibility would be to indicate that an overexposed report has been sent to the Agency in reference to the exposure report.